

WHAT IS CLAIMED IS:

1. A method for manufacturing a semiconductor device, comprising:
 - (a) forming electrical interconnections over a surface of a semiconductor substrate having integrated circuits;
 - (b) providing a plurality of bonding pads disposed on the surface of the semiconductor substrate;
 - (c) electrically connecting the electrical connections to respective bonding pads of the plurality of bonding pads;
 - (d) electrically connecting the plurality of bonding pads to each of the integrated circuits;
 - (e) forming resin layers so as to cover the electrical interconnections;
 - (f) forming concave portions by a first process, each of the concave portions being disposed in a corresponding portion of the resin layers that cover the electrical interconnections;
 - (g) curing the resin layers having the concave portion;
 - (h) forming through-holes by removing bottoms of the concave portions by a second process that differs from the first process; and
 - (i) forming external connection terminals, each being disposed on a corresponding area of the electrical interconnections exposed through the through-holes.
2. The method for manufacturing a semiconductor device according to claim 1, further comprising forming the resin layers using a thermosetting resin precursor in step (e); and the thermosetting resin is heated in step (g).

3. The method for manufacturing a semiconductor device according to claim 1, further comprising forming the resin layers using a radiation-sensitive resin precursor in step (e); and the first process involves a step of irradiating the resin precursor with radiation and a step of developing the irradiated resin precursor.

4. The method for manufacturing a semiconductor device according to claim 1, further comprising dry etching in the second process.

5. The method for manufacturing a semiconductor device according to claim 1, further comprising composing each of the resin layers of solder resist.

6. A semiconductor device manufactured by a method according to claim 1.

7. A circuit board on which a semiconductor device according to Claim 6 is mounted.

8. An electronic apparatus comprising a semiconductor device according to claim 6.

9. A semiconductor wafer, comprising:
a semiconductor substrate including a plurality of integrated circuits and a plurality of bonding pads provided on a surface of the semiconductor substrate, with the plurality of bonding pads being electrically connected to the plurality of integrated circuits;
electrical interconnections formed over the surface of the semiconductor

substrate and electrically connected to respective bonding pads of the plurality of bonding pads;

resin layers covering the electrical interconnections;

concave portions formed by a first process with each of the concave portions being disposed in a corresponding portion of the resin layers that cover the electrical interconnections;

through-holes formed by removing bottoms of the concave portions by a second process that differs from the first process; and

external connection terminals disposed on a corresponding area of the electrical interconnections exposed through the through-holes.

10. The semiconductor wafer according to claim 9, wherein the resin layers are formed using a thermosetting resin precursor, wherein the thermosetting resin is heated.

11. The semiconductor wafer according to claim 9, wherein the resin layers are formed using a radiation-sensitive resin precursor.

12. The semiconductor wafer according to claim 9, wherein the first process involves irradiating the resin precursor with radiation and developing the irradiated resin precursor.

13. The semiconductor wafer according to claim 9, wherein the second process is dry etching.

14. The semiconductor wafer according to claim 9, wherein each of the resin layers is composed of solder resist.

15. The method for manufacturing a semiconductor device according to claim 1, further comprising forming a passivation layer of an inorganic material selected from the group consisting of silicon dioxide and silicon nitride.

16. The method for manufacturing a semiconductor device according to claim 1, further comprising forming the bonding pads on an upper surface of the semiconductor substrate.

17. The method for manufacturing a semiconductor device according to claim 1, further comprising forming a stress relieving layer on the semiconductor substrate by applying a resin precursor.

18. A semiconductor wafer, comprising:
a semiconductor substrate including a plurality of integrated circuits and a plurality of bonding pads provided on a surface of the semiconductor substrate, with the plurality of bonding pads being electrically connected to the plurality of integrated circuits;

electrical interconnections formed over the surface of the semiconductor substrate and electrically connected to respective bonding pads of the plurality of bonding pads;

means for covering the electrical interconnections;

concave portions formed by a first process with each of the concave portions being disposed in a corresponding portion of the means for covering that cover the electrical interconnections;

through-holes formed by removing bottoms of the concave portions by a second process that differs from the first process; and

external connection terminals disposed on a corresponding area of the

electrical interconnections exposed through the through-holes.

19. The semiconductor wafer according to claim 18, wherein the means for covering are formed using a thermosetting resin precursor, wherein the thermosetting resin is heated.

20. The semiconductor wafer according to claim 18, wherein the means for covering are formed using a radiation-sensitive resin precursor.